

Grandin (E. H.)

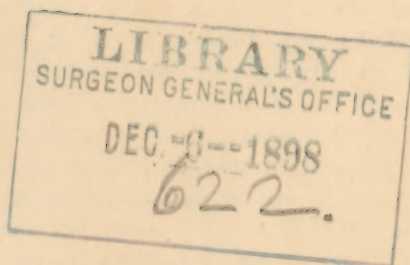
PEDIATRICS



DISEASES OF INTRA-UTERINE LIFE ON THE PART OF THE MOTHER.

BY EGBERT H. GRANDIN, M. D.

CONSULTING GYNECOLOGIST TO THE FRENCH HOSPITAL, ETC., NEW YORK.



DISEASES OF INTRA-UTERINE LIFE*—ON THE PART OF THE MOTHER.

By EGBERT H. GRANDIN, M. D.,

Consulting Gynecologist to the French Hospital, Etc., New York.

THE portion of this topic assigned to me by your President is that which relates to the effect of disease of the child-bearing woman on the fetus. When requested by him to prepare a paper on this subject, I confess I little realized the obscurity which surrounds it, nor the task of Sisypheus I had undertaken in endeavoring to sift from the mass of theory enveloping it sufficient that is known as fact to justify me in appearing before you at all. My own researches in literature and those which my colleague, Dr. Marx, has undertaken in my behalf teach me that very little of a positive nature is recorded bearing on this all-important subject. I take it that I am not desired to rehearse for you well authenticated facts, but that I am expected, as a scientific man reading to a scientific body, to endeavor to add at least a mite to given knowledge. After summarizing for you the little of a definite nature which I find recorded in regard to disease of the woman as affecting the fetus, I trust, when I venture, as I needs must, to theorize you will bear in mind the fact that it is in no spirit of dogmatism, but because I must theorize if I speak at all.

I shall not waste your time in dwelling on the well-known effect of high maternal temperature on the fetus, nor shall I mention more than thus cursorily the fact that a not infrequent result of such constitutional disturbance is the shedding of the ovum. Neither shall I refer at all to the vexed question as to whether impressions of the mother may be transmitted through the nervous system to the fetus—the so-called doctrine of maternal impressions. One would think that this latter doctrine, whatever the occasional strong proof offered, had long ago been exploded when it was certified that there existed no communication by means of nerve filaments between the woman and the fetus. I take it that I shall best succeed in interesting you, if perchance I do so at all, by dwelling in the first place on the acute and chronic diseases which experimental research and actual experience have proven in some way or another reach the fetus when the woman is affected, and in the second place by theorizing as to how these diseases are transmitted.

It is only in the lifetime of most of us here present that bacteri-

* Read by invitation before the Medical Society of the State of New York, January 28th, 1896.

ological research has enabled us to speak at all dogmatically in regard to the transmissibility of disease from the woman to the fetus. This is one of the fruits of the advanced stage where the science of medicine finds itself to-day, and who can predict the wonderful possibilities of research along the same line in the not distant future? Experimentation on gravid animals and sparse clinical observation in the case of woman prove that most of the acute infectious diseases may be transmitted from woman to the fetus. Thus, to specify briefly certain of the individual diseases: Variola can undoubtedly be transmitted. Cases are recorded where the woman has had this disease and the fetus has been born bearing pock-marks; other cases where the woman has been exposed to the disease, has escaped it and yet the fetus has been born with it. Strangely enough, and something almost impossible to understand, of twins, one has been covered with pock-marks and the other not; and, more curious still, immunization of the woman by vaccination has failed to protect the fetus.

Transmission of measles has only exceptionally been noted, but then we must remember that this disease is one which rarely affects adults, since the vast majority have suffered from it in infancy. Yet the researches of Dr. Marx have resulted in six cases being found on record.

Intra-uterine infection by scarlet fever is unquestioned, and the same holds true for erysipelas. In regard to the latter affection, it should be noted that in one recorded case the bacillus was found in the sub-cutaneous tissue of the fetus, and yet not in either the placenta or the cord. Three cases have been recorded where remittent fever affected the fetus, in one the spirilla having been found. In two of the cases, one of which was witnessed by Dr. Marx, the woman had a distinct sensation of violent motion on the part of the fetus as though it were having a rigor, shortly after she had had a chill.

There is but one undoubted case on record of transmission of tuberculosis. This is not unexpected when we remember that markedly tubercular women are not prone to conceive. Septicemia is transmissible, the cases where this has been observed being few, but then, since the development of the science of bacteriology, we have rarely had the opportunity of seeing instances of sepsis developing before labor, even as gradually these cases are becoming more and more infrequent after labor, as the fact is impressed on students that it is an avoidable disease where asepsis characterizes obstetric practice.

The facts in regard to syphilis are too well known to call for

comment here. Indeed more is fact in reference to this scourge, and has been such for long, than in regard to the transmissibility of any other disease. So far as concerns our present purpose, sufficient the statement that a syphilitic woman, if she conceive at all, will necessarily infect the fetus; and, further, if she become syphilitic whilst bearing the fetus, the chances are that the latter will become infected.

In short, so far as my researches have carried me, there is but one acute disease which the woman is not able to transmit to her child *in utero*, and this is anthrax. I can find no case on record where this disease has been transmitted, and the positive opinion is justified that such transmissibility has never been verified.

Having established the fact of the transmissibility of disease, we pass to the important question, and the one where theory of necessity steps in, as to how the transference is effected.

Broadly speaking, disease is carried throughout the human body either through the medium of the blood vessels or by the lymphatic system. That is to say, whatever the source of original entrance of the germ, whether by the alimentary canal or the respiratory tract, it is disseminated throughout the body either through the medium of the blood or the lymph stream. Now, in the case of the fetus *in utero*, since so far as we can determine it neither breathes nor eats, infection must reach its system by either blood or lymphatic stream. Recalling for a moment the anatomy of the placenta and the well-established facts in regard to the connection of the maternal system to the fetal, we see that direct transmission of disease from the woman to the fetus by either method is an impossibility, since there is no connection between the blood or lymphatic system of the one and that of the other. The placenta intervenes between the woman and the fetus, and direct interchange of material is precluded by the anatomical relation of placenta to uterus. The fetus, of course, receives its nourishment from the maternal blood, but indirectly, through the interposing medium of the placenta. As far as researches testify, it is probable that interchange of material occurs in the intervillous spaces which constitute the boundary line between maternal decidua and fetal. Here the activity of the blood current is very marked and the conditions which favor interchange are most favorable. Either, then, material, nutrient or toxic, reaches the fetus through the medium of these spaces by simple transfusion, or else by migration of leucocytes. It seems to me that in the light of modern data in reference to the germ-bearing capacity as well as germ-destroying faculty of the leucocytes we most

rationally look to them as the carriers of disease from the woman to the fetus. This explanation, further, will be seen best to accord with certain facts which have been established in regard to conditions under which disease is apt to reach the fetus and as to when it is not.

All investigators into the question of the tranference of disease from the woman to the fetus are agreed as to the important rôle played by the placenta and the intervillous spaces. It has been accurately established that a *sine qua non* for the transmission of disease is a diseased state of the placenta. Take, for instance, certain facts established in reference to syphilis. It has been noted that where a woman becomes infected at the time of copulation, syphilitic foci often develop in the maternal portion of the placenta leading to a placental endometritis. Thus, then, a healthy ovum becomes infected because of the similar infection of the placenta. Again, it has been established that where the woman is syphilitic before conception occurs, or else where she becomes infected shortly after conception, where the placenta remains unaffected, the fetus escapes, and *vice versa*. Again, it has been proven that where the woman does not become infected until after the seventh month of gestation the placenta escapes infection and the fetus as well. All these facts go to prove that a healthy placenta offers a barrier to the transference of disease from the woman to the fetus. Similar investigations in regard to the placenta in case of other diseases from which the woman is suffering at the time of conception, or which affect her during gestation, certify to the truth of this assertion in reference to the safeguard against the entrance of disease into the fetus offered by the interposition of a healthy placenta.

The theory, then, which fits known facts, and which we must at the present day accept, is that which credits the leucocytes with transmission of disease from the woman to the fetus. Given an instance where the woman is in health at conception, and for a certain period afterwards, and the chances are that the placenta intervening between woman and fetus is healthy. Now let this woman become diseased and at once the leucocytes in her blood system carry the infection to the intervillous spaces. Here they are met by the barrier against disease established by the healthy placenta. This placenta contains healthy leucocytes with the property of resisting the entrance of diseased germs. The phagocytic action of these healthy leucocytes comes into play, destroys at once the leucocytes bearing disease, and thus the fetus is protected.

Given, on the other hand, a woman diseased at the time of con-

ception, or becoming so shortly afterwards, that is to say, at a period when the placenta is in the course of early formation, then either we have at the outset a diseased placenta or one which becomes diseased as it is forming. Such a placenta contains either no healthy leucocytes or else they have but feeble resisting powers. The barrier interposed by the placenta is, therefore, ineffective to an absolute degree, or else the leucocytes within it resist feebly or strongly, according to the intensity of the disease process endeavoring to gain access from the side of the woman. In this latter event disease is transmitted to the fetus, because the disease-bearing leucocytes from the side of the woman are stronger than and overcome the leucocytes in the placenta.

The question we are considering is possibly not so difficult of solution where the woman is affected by a disease, such as tuberculosis or syphilis, at the time of conception. If this woman conceive at all, it is not improbable that the ovum at the time of insemination contains the germs of such disease, or, at any rate, in case the ovum should perchance be healthy, then we might consider that the uterine mucosa, where the placenta must engraft itself and develop, is diseased. In such an event the fetus may be said to be diseased from its very start toward life, or in life, since we must look upon the germ of life as present from the very date of insemination. Such a fetus dies early and is shed early, from the very fact of death due to the disease from which the woman is suffering. The data we possess in regard to early miscarriage prove its great frequency under the condition we are considering. Here disease is transmitted to the fetus from the woman, because of the existence of such disease in the woman prior to conception. The limitations of our, as yet, finite powers of observation and analysis do not allow us to prove this assertion, for who can examine the ovum at a stage when it has but become endowed with life, and who, as yet, is able to do more than theorize in reference to the constitution of the germinal area, whether it can contain the germ of disease and still grow or not? All that we are justified in doing, therefore, is to theorize, and I can but submit that the theory I have stated rests on a basis of probability.

The limitations of theory are about as absolute when we face the question of the transmission to the fetus of disease which the woman has acquired during gestation. In such an event, as we have noted, a *sine qua non* appears to be the presence of a diseased placenta. We must assume then that, in instances where transmission occurs, the soil in which the placenta has developed was diseased

before conception, not sufficiently to lead to a placentitis inconsistent with fetal development, but yet of a high enough grade to interpose a very feeble barrier to the leucocytes from the side of the woman bearing the germs of the disease which has attacked her during gestation. When we remember the frequency with which the milder grades of endometritis are met with in women who nevertheless conceive and carry the fetus to term, it is not improbable that the vast majority of women do not possess an ideally healthy placenta; that is to say, that in the average woman the conditions exist at the placental site which enable the transmission of disease from woman to fetus to occur.

Such, Mr. President, are the slender facts tinged with weighty theory which I am able to offer. I regret that much thought and research have not enabled me to penetrate deeper the gloom which enshrouds this important topic. But, even as we note the growth and the death of the flowering plant without the ability to solve all the elements which enter into the marvel, even so, when endeavoring to elucidate a question dealing with a greater marvel still—the history of life in man before life, such as we know it, begins—can any one wonder that theory prevails and fact has stringent limitations?



Published on the 1st and 15th of the Month, \$2 or 8 Shillings a Year.

PEDIATRICS

An Illustrated Semi-Monthly Devoted to the
DISEASES OF CHILDREN.

OWNER:

DILLON BROWN, M. D.
NEW YORK.

EDITOR:

GEO. A. CARPENTER, M. D.
LONDON.



EDITORIAL STAFF:

Medicine.

A. Jacobi, M. D., New York, *Clinical Professor of Diseases of Children in Columbia College.*
Frederick Forchheimer, M. D., Cincinnati, *Ex-President of the American Pediatric Society, and Professor of Diseases of Children in the Medical College of Ohio.*

Surgery.

Henry R. Wharton, M. D., Philadelphia, *Surgeon to the Children's and the Presbyterian Hospitals.*
Frederic S. Eve, F. R. C. S., Eng., London, *Surgeon to the London Hospital and to the Evelina Hospital for Children.*
Lambert H. Ormsby, M. D., F. R. C. S. I., Dublin, *Surgeon Meath Hospital and National Children's Hospital.*

Orthopedics.

Henry Ling Taylor, M. D., New York, *Assistant to the Hospital for Ruptured and Crippled.*
Frederic R. Fisher, F. R. C. S., Eng., London, *Senior Surgeon to the National Orthopedic Hospital, and late Surgeon to the Victoria Hospital for Children.*

Therapeutics.

Reynold Webb Wilcox, M. D., New York, *Professor of Therapeutics in the Post-Graduate Medical School, and Physician to St. Mark's Hospital.*
John Thomson, M. D., Edinburgh, *Extra Physician Royal Hospital for Sick Children, and Lecturer on Diseases of Children, Edinburgh School of Medicine.*
Dawson Williams, M. D., London, *Physician to the East London Hospital for Children.*

Teratology.

Egbert H. Grandin, M. D., New York, *Ex-President of the County Medical Society; Consulting Obstetric Surgeon to the Maternity Hospital, and Gynecologist to the French Hospital.*
J. W. Ballantyne, M. D., Edinburgh, *Lecturer on the Diseases of Infancy and Childhood, Minto House; and Physician for Diseases of Children, Cowgate Dispensary.*

Gastro-Enteric Diseases.

Morris Manges, M. D., New York, *Physician to Mount Sinai Hospital, and Editor of "Ewald's Diseases of the Stomach."*
J. Boas, M. D., Berlin, *Editor of the "Archiv fur Verdauungs-krankheiten."*

Genito-Urinary Diseases.

Frederic Russell Sturgis, M. D., New York, *Visiting Surgeon to the City Hospital.*
Fancourt Barnes, M. D., London, *Consulting Physician to the British Lying-In Hospital, St. George's Hospital, Seamen's Hospital and East London Hospital for Children.*

Neurology.

Joseph Collins, M. D., New York, *Physician to the Hospital for Nervous Diseases.*
James Taylor, M. D., London, *Senior Assistant Physician to the National Hospital for the Paralysed.*

Materia Medica.

Henry H. Rusby, M. D., New York, *Professor of Materia Medica and Botany in the College of Pharmacy.*

Laryngology and Otology.

Wm. C. Glasgow, M. D., St. Louis, *Professor of Laryngology in the Missouri Medical College.*
Arthur H. Cheate, F. R. C. S., London, *Assistant Surgeon to the Royal Ear Hospital and Aural Department of King's College Hospital.*
Max Thorner, M. D., Cincinnati, *Professor of Laryngology and Otology, Cincinnati College of Medicine and Surgery; and Aurist and Laryngologist to the Cincinnati Hospital.*
Peter McBride, M. D., Edinburgh, *Aural Surgeon and Laryngologist, Royal Infirmary; and Lecturer on the Diseases of the Ear and Throat, Edinburgh School of Medicine.*

Dermatology.

James Nevins Hyde, M. D., Chicago, *Professor of Skin and Venereal Diseases in Rush Medical College.*
Leslie Phillips, M. D., Birmingham, England, *Surgeon Birmingham and Midland Skin and Lock Hospital.*

Ophthalmology.

Myles Standish, M. D., Boston, *Ophthalmic Surgeon to Carney Hospital and to Massachusetts Charity Eye and Ear Infirmary.*
William Arthur Brailey, M. D., London, *Ophthalmic Surgeon to Evelina Hospital for Children, and Guy's Hospital.*

Pathology and Bacteriology.

Henry Ashby, M. D., Manchester, England, *Physician Manchester General Hospital for Children; and Lecturer on Diseases of Children, Owen's College.*
Alfred Lingard, M. D., Poona, India, *Professor of Bacteriology, Science College.*

Physiology.

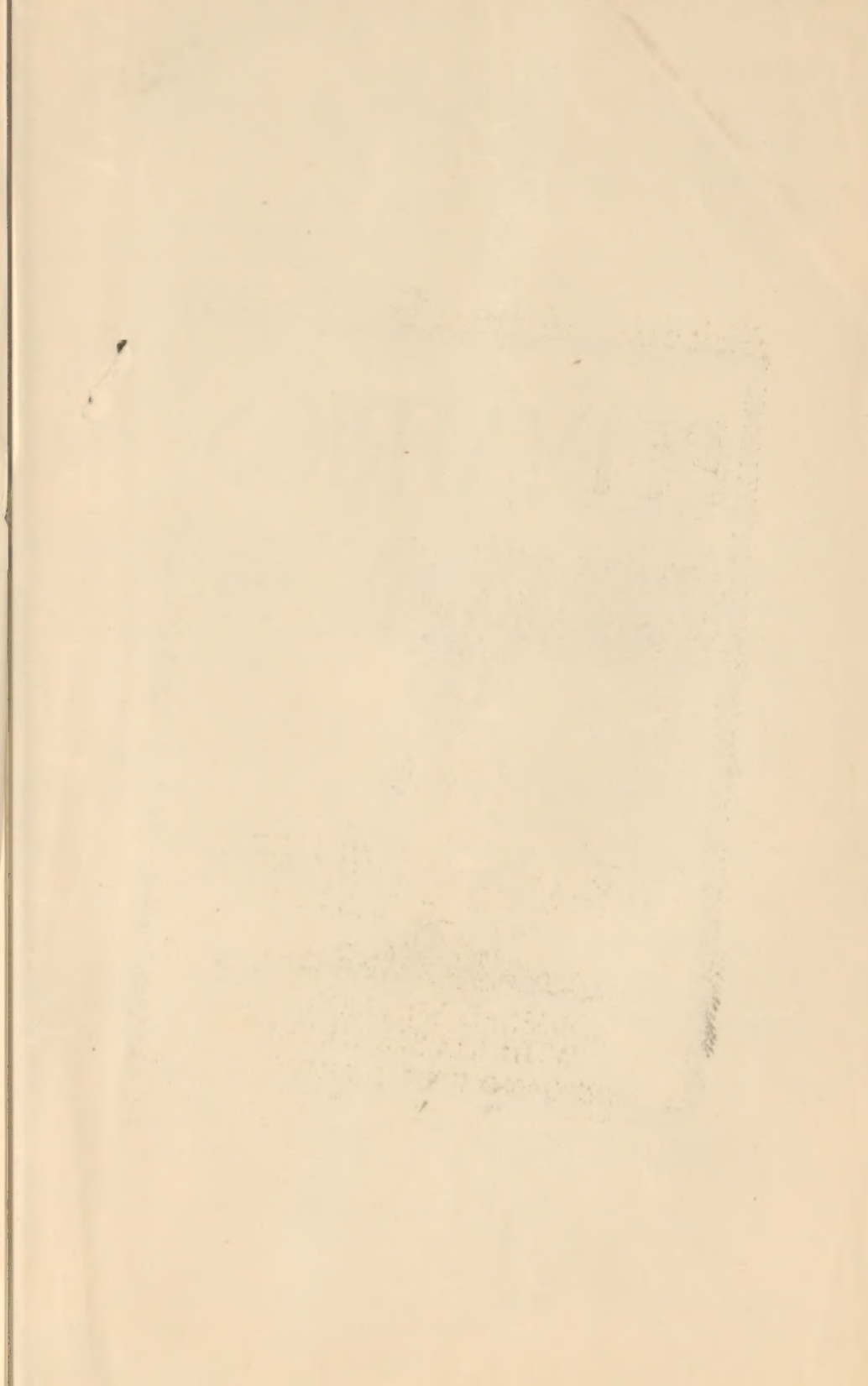
C. S. Sherrington, M. D., F. R. S., Liverpool, England, *Holt Professor of Physiology, University College.*

Psychology.

T. Telford-Smith, M. D., Lancaster, England, *residential Medical Superintendent, Royal Albert Asylum.*

Tropical Diseases.

Major H. P. Birch, Quetta, India, *Surgeon.*



VOL. I No 1

JANUARY 1ST 1896

\$2 OR 8s A YEAR

PEDIATRICS



DEVOTED TO THE
DISEASES OF CHILDREN



PUBLISHED SEMI-MONTHLY
WITH ILLUSTRATIONS

VAN PUBLISHING CO 1432 BROADWAY COR 40TH ST. NEW YORK
JOHN BALE & SONS, 85-89 GREAT TITCHFIELD ST. W. LONDON